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ABSTRACT

This paper offers a synthesis of research on cooperative learning in small groups. The main challenge for teachers who utilize cooperative learning is to stimulate the type of interaction desired according to their teaching objective. A generalization regarding student interactions is that if students are not taught differently, they will tend to operate at the most concrete level. Student participation in a task group that is structured to foster resource- or goal-interdependence appears to increase student motivation and performance. The effectiveness of the group structure depends on the task's complexity and uncertainty and on the extent to which the instructions attempt to micromanage the interaction process. Information is also offered on ensuring equity in interaction, managing the interaction, and unsettled issues, such as special curricula and assessment. Successful implementation of cooperative learning also requires staff development and principals who demonstrate effective managerial skills and instructional leadership. (LMI)

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Restructuring the Classroom: Conditions for Productive Small Groups

By Elizabeth G. Cohen

Cooperative learning in small groups embodies many of the social and academic goals of school restructuring. Its advantages have been trumpeted for decades, and it has gained increasing acceptance worldwide as a means to enhance achievement on both basic skills and higher order thinking, and to promote productive social behavior and improve racial and ethnic harmony. Cooperative learning also presents a method for managing a class or group with a wide range of academic achievement such as those found in untracked schools.

Early research on cooperative learning yielded apparently conflicting results. In some studies, group learning was observed to substantially improve achievement and social relations, whereas in others, the results on achievement tests were no different from those in traditional instruction. These varied results suggest that the advantages of cooperative learning might be realized only under certain conditions. However, research that compared cooperative instructional methods to non-cooperative methods on outcomes alone without examining what was happening in the interaction of group members could not reveal just what these critical conditions were.

In the past decade, research has gone beyond this approach to concentrate on the effects of changing various features of cooperative learning so as to highlight the importance of particular conditions for success on different kinds of instructional outcomes. This research can help teachers devise cooperative learning activities with the conditions chosen to produce desired learning goals.

Both researchers and practitioners would do well to focus directly on the type of interaction that is desired. There is, for example, a major difference between the type of interaction useful for the more routine types of academic learning and the type of interaction desired when the objective is learning for understanding or conceptual learning. For more routine learning, students should help each other to understand what the teacher or the textbook is saying and should offer each other substantive and procedural information. For conceptual learning, the interaction desired is more of a mutual exchange process in which ideas, hypotheses, strategies and speculation are shared. The main challenge for teachers is to stimulate the type of interaction desired according to their teaching objective. Courtney Cazden of Harvard University and I have recently synthesized research findings. The results, summarized here, have major implications for teachers of small groups, and for principals, staff developers, and district administrators.

What is a Cooperative Learning Group?

In a cooperative learning group students work together in a group small enough so that everyone can participate on a task that has been clearly assigned. Students are expected to carry out their task without direct and immediate supervision of the teacher. The level of learning involved can vary from routine to abstract; however, cooperative learning groups are often promoted to facilitate higher level discourse and higher order thinking. They can also be used to foster general cooperative behavior and equal-status interaction between students who differ in status due to income, ethnicity, race or perceived ability. Cooperative learning groups contrast with traditional individualistic instruction. The teacher of a small cooperative group plays quite a different role than usual, giving direction to new patterns of interaction among students.

Student Interactions

Theorists of group interaction in classrooms differ as to how explicit and rational discourse should be for productive small groups. The social constructivists have documented how groups negotiate meaning moment by moment while others see effective cooperative learning as an explicit strategy in which groups must manage the process of problem solving with conscious planning and execution of tasks. Researchers who have actually recorded interaction within cooperative learning groups have often been disappointed by what they have heard. For example, in the de-bugging of computer programs, students with no preparation in group interactions, interact only at the level of line-by-line debugging, with little discourse on the overall strategy or logic of the program. [1] Observers have also witnessed interpersonal processes that are anything but cooperative among untrained participants in "cooperative learning."

Our review of studies of interaction suggest this useful generalization: If students are not taught differently, they will tend to operate at the most concrete level. If teachers want high-level operation, particularly verbal, the students will require specific development of skills for discourse, either in advance of cooperative learning or through direct assistance when the groups are in operation. In addition, since interpersonal skills do not develop as an automatic consequence of being placed in cooperative settings, something must be done in the way of deliberate skills building or through special motivational devices to produce the desired behaviors.

Interaction and Achievement

If group learning is beneficial, then one would expect achievement to increase as student interaction increases. But Webb's reviews of a large

EA 025 435

body of meticulously conducted studies indicate that the simple frequency of interaction of individuals does not predict their achievement.[2] In contrast to this body of work, stand a number of studies conducted on complex instruction in multilingual elementary classrooms where interaction consistently predicts gains on standardized achievement tests whether at the individual or classroom level[3]

One explanation of these differences is that groups which did not benefit from interactions were not given authentic "group tasks." A group task has two characteristics. First, it requires the resources (information, skills, materials) that no single person possesses; success on the task requires the contribution of many. Some of the groups where interaction was not beneficial involved straightforward math exercises which did not require collective action. Second, there must be interdependence, and the interdependence between students must be reciprocal. An interdependence in which better students always aid weaker students is a one-way dependence. Interdependence is reciprocal if each student is dependent on the contributions of all others. We hypothesize that only when there is a group task requiring such mutual interchange, will interaction become a direct predictor of productivity, e.g. learning gains.

If the problem given to the group is more routine and amenable to cookbook solutions, collaborating may be unnecessary for some individuals. In contrast, groups which deal with ill-structured, non-routine, discovery-oriented tasks become more productive as interactions increase because mutual interchange is a necessary condition for solving the problem.

Whether or not interaction is directly related to achievement, designers of cooperative learning all have to contend with the problem of how to motivate students to interact as a group. Especially if each individual must turn out some kind of worksheet or report, students may well ignore each other and tackle the task as individual work despite the teacher's instructions to work together and to help each other. This is why it is commonly recommended that the task instructions make the students interdependent, either through using each other as resources (resource interdependence) or through working towards a mutual goal (goal interdependence). According to our analysis, the effects of resource and goal interdependence on productivity will depend on how well these task arrangements stimulate interaction. By themselves, neither is sufficient to motivate group members to participate.[4]

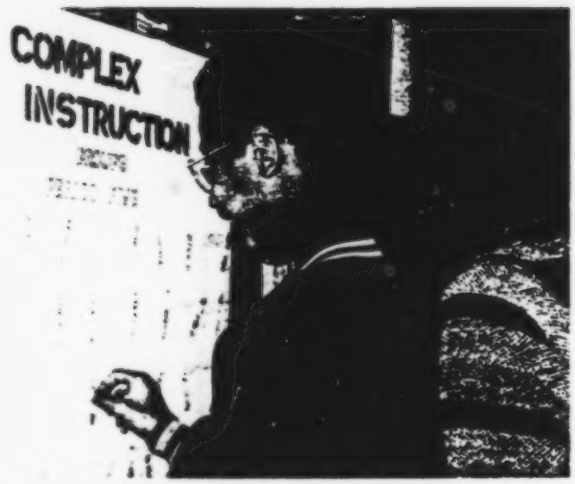
One way to persuade group members to assist those in need of help is to make a group reward contingent on the performance of individual members. Based on extensive research and reviews of research, Slavin has made the strong assertion that cooperative learning results in reliable achievement gains only through a combination of group rewards (reward interdependence) and individual accountability.[5] Many of his own and other studies have documented the enhancement of individual achievement through rewarding pupils as a group. No aspect of cooperative learning has been as controversial as the issue of giving rewards to competitive groups. The issue relates to the ideological controversy of cooperation versus competition, and intrinsic versus extrinsic rewards. In Slavin's well-known technique of STAD (Student Teams-Achievement Division), individual accountability is just as important as the use of group rewards; students are held accountable by having to prepare individual work and having to take an individual test. At the same time the group is held accountable by being given a group score after the test based on the improvement of each individual over the last test score.

The effectiveness of these group rewards, however, should not be taken to mean that it is not possible to hold individuals accountable or to motivate them to participate without such rewards. Such rewards are not used in either the Sharans' Group Investigation technique that produced superior results to STAD on items measuring higher order thinking, nor are they used for complex instruction where the activities are intrinsically interesting and have also been shown to be effective in raising scores on measures of achievement.[6] Slavin's original proposition would appear to apply better to more routine learning and to the kinds of collective or collaborative seatwork tasks that are so common in cooperative learning. In those situations, it is of vital importance to motivate those who could do the task by themselves to assist those who are having difficulty.

Structuring the Interaction

We found considerable research on the relative effectiveness of structuring the interaction within small groups by telling students what to say, providing them with explicit roles, or by teaching them strategies for discussion. We propose that the effectiveness of structuring the interaction will depend on the complexity and uncertainty of the task and on whether or not the instructions attempt to micromanage the process of thinking and talking within the groups. If the task is to apply concepts and procedures in a relatively routine fashion (such as applying straightforward map skills) or simply to understand a reading assignment, then scripting the interaction has been shown to be very effective. For example, in a paired interaction in which they are required to synopsize some presented material, one student can be designated as the "learning leader" and one as the "learning listener." The leader summarizes and restates the main points of the material, and the listener asks probing questions, encourages improved explanations, and inserts omitted information.[7]

This format is useful for learning to recall information and basic definitions, that is, lower order skills. As the tasks become more sophisticated,



Students find their role assignments for small groupwork

requiring higher order thinking for more creative outcomes, we hypothesize that the interactions must be less constrained by the teacher. The students need more freedom to define problems and to construct knowledge independently. As the task objectives increase in cognitive complexity, task arrangements and instruction should foster more conceptual and elaborate discussions.

This proposition should not be taken to mean that minimal procedures or task instructions work best in fostering elaborated discourse. On the contrary, elaborate procedures and roles have been shown to foster higher level discourse. For example, the technique of constructive controversy has been shown to foster high-level discussion leading to conceptual understanding with elaborate procedures and the use of student roles.[8] A four-person group is divided into two pairs, with each pair assigned to espouse one side of an issue in a discussion. Within the pairs each person deals with different information relevant to his or her role or position in the controversy. Then the sides switch. Finally, the full group constructs a consensus viewpoint and expresses it in a report. This format aids the student in taking multiple perspectives as measured by achievement tests and is markedly superior to simply asking groups to discuss the controversy and to come to consensus.

Although roles given to students clearly structure the interaction, they can either constrain or facilitate high level discourse. If roles are used to divide labor, e.g. artist, writer, the result may be very little interaction of any kind as students go about their jobs. In contrast, Ehrlich found that a reporter role can be used to foster reciprocal interdependence resulting in significantly higher rates of scientific behaviors such as observing and inferring on a criterion task.[9] In this case, the reporter prompted the group members to specify their predictions for the experiment, to elaborate their reasoning and to pinpoint differences between their predictions and observations.

Insuring Equity in Interaction

Of course, all group members will not make equal contributions. Those perceived by the group to have more academic ability or those who are more popular usually interact more frequently and are more influential.[10] The result is that the low status members gain less from the group, and the group suffers from the absence of their contribution. The difference in social status can also arise from race, ethnicity, or gender. Expectations for competence based on status can result in self-fulfilling prophecies. Students who are viewed as having low status will often participate less because they are expected to be less competent and because they expect themselves to be less competent. As a result, they will appear to be less capable to themselves and others during cooperative learning. Collective tasks actually activate expectations for competence and incompetence based on difference in status.

Teachers can alter these expectations for competence. For example, they can convince students that many different abilities are relevant to the cooperative learning tasks and that each person will be competent on at least one ability while no one person will be competent at all the required abilities. Research has shown that it is possible for teachers to treat these status problems in regular classrooms so that low status students participate more frequently and so that there are few differences in interaction in the classroom between high and low status students during the operation of the small groups.[11]

Managing the Interaction

Although group tasks diminish teachers' control over the specific directions of classroom discourse, the teacher is no less influential to the learning process than in the traditional setting. It is quite a challenge for the teacher to guide and insure the effectiveness of the group without direct supervision. This is accomplished by building students' skills in discourse, by assigning well-chosen tasks for the groups, and by holding students accountable as individuals and as groups. The teacher does not instruct each group in its activity, but must delegate authority to the students. Research on complex instruction shows that direct instruction while the groups are in operation cuts down on student interaction and thereby restricts gains in learning outcomes.[12]

Many developers of cooperative learning strongly recommend that team-building or skill-building activities designed to develop the pro-social behaviors necessary for cooperation as well as some specific skills for elaborated discourse take place prior to groupwork. Or, adapting techniques from group dynamics, they suggest that

groups become aware of their interpersonal and work processes as they work and take time to discuss how they are doing as a group. Available research on the effectiveness of such strategies suggests that investing in such preparation and time spent on group process can definitely make for more productive groups. However, the research shows that in order to be effective, the behaviors taught must not only be specific, but they should be directly relevant to the desired behaviors in the particular tasks that the teacher has assigned to the groups.

Unsettled Issues

Two particular issues remain unsettled. First is the question of the necessity for special curricula for cooperative learning. If, as many developers believe, this is a necessity, there are further questions on the changes in the curriculum needed. Second, the optimal means of assessment of students in cooperative learning has not been studied extensively. Should there be group or individual examinations? Conventional tests are still appropriate for certain outcomes of small groupwork, but not all.

Organizational Support and Staff Development

The implementation of sophisticated cooperative learning models have major implications for staff development, for the ways in which teachers work together and for the principal's role. Researchers have concluded that teachers require significant support in their classrooms from staff developers, from the principal and from their colleagues if implementation is to be significant and sustained. From a research perspective, we know next to nothing about how well teachers implement the simple strategies typically taught in short-term workshops.

Evaluation of more extensive staff development programs suggest that longer preparation is more effective in helping teachers to implement cooperative learning. Moreover, even with the most sophisticated and lengthy programs, a significant number of teachers fail to implement. There is also evidence that workshops that place emphasis on the theoretical and research underpinnings of specific instructional strategies can be very effective, provided that teachers really grasp the theory. A fundamental understanding of the underlying theory permits teachers to move away from traditional roles of direct supervision and to take on new and more challenging teacher behaviors. This is especially critical when there is a stress on conceptual learning and higher-order thinking and tasks which involve considerable uncertainty from the students' point of view.

It is very difficult to provide effective feedback to teachers without direct observations of their classes and face-to-face meetings.[13] Teachers who received up to three feedback sessions from developers were much more successful in their implementation than teachers who received fewer sessions.[14] Peer coaching in the first year does not appear to provide evaluations for teachers that are seen as soundly based as those received from staff developers. However, after the first year, there is evidence for the effectiveness of peer coaching when the peer coaches have good preparation for making observations and providing specific feedback.

Finally, several school features contribute to the likely success and extent of cooperative learning in a given school. Principals who have effective managerial skill in obtaining and coordinating resources, such as adequate space and planning time have better classroom implementation than less skilled principals. In addition, effective implementation in the classroom is associated with principals who provide instructional leadership by setting high expectations that teachers will follow through after the initial workshop.◆

References

1 Webb, N., Ender, P., & Lewis, S. (1986). Problem-solving strategies and group processes in small groups learning computer programming. *American Educational Research Journal, 23*, 243-251.

2 Webb, N. (1991). Task-related verbal interaction and mathematics learning in small groups. *Journal of Research in Mathematics Education, 22*, 366-389; Webb, N. (1983). Predicting learning from student interaction: Defining the interaction variable. *Educational Psychologist, 18*, 33-41.

3 See for example: Cohen, E.G., Lotan, R., & Leechor, C. (1989). Can classrooms learn? *Sociology of Education, 62*, 75-94. For a description of complex instruction, see "Making Small Groups Productive" in this *Issue Report*.

4 Johnson, D., Johnson, R., Stanne, M., & Garibaldi, A. (1990). Impact of group processing on achievement in cooperative groups. *Journal of Social Psychology, 13*, 507-516.

5 See for example: Slavin, R. (1983). When does cooperative learning increase student achievement? *Psychological Bulletin, 94*, 429-445.

6 Sharan, S., Kussell, P., Hertz-Lazarowitz, R., Begarano, Y., Raviv, S., Sharan, Y. (1984). *Cooperative learning in the classroom: Research in desegregated schools*. Hillsdale, NJ: Lawrence Erlbaum.

7 Yager, S. (1985). *The effects of structured oral discussion during a set of cooperative learning lessons on student achievement and attitude*. Unpublished doctoral dissertation, University of Iowa, Iowa City.

8 Smith, K., Johnson, D.W., & Johnson, R.T. (1981). Can conflict be constructive? Controversy versus concurrence seeking in learning groups. *Journal of Educational Psychology, 73*, 651-663.

9 Ehrlich, D.E. (1991). *Moving beyond cooperation: Developing science thinking in interdependent groups*. Unpublished doctoral dissertation, Stanford University, Stanford, CA.

10 Cohen, E.G. (1984). Talking and working together: Status interaction and learning. In P. Peterson, L.C. Wilkinson, & M. Hallinan (Eds.), *Instructional groups in the classroom: Organization and process*. Orlando, FL: Academic Press.

11 Cohen, E.G. (1988). *Producing equal status behavior in cooperative learning*. Paper presented at the convention of the International Association for the Study of Cooperation in Education, Shefayim, Israel.

12 Cohen, E.G., Lotan, R., & Leechor, C. (1989). Can classrooms learn? *Sociology of Education, 62*, 75-94.

13 Putnam, J. (1985). Applications of classroom management research findings. *Journal of Education for Teaching, 11*, 145-164.

14 Ellis, N. (1987). *Collaborative interaction and logistical support for teacher change*. Unpublished doctoral dissertation, Stanford University, Stanford, CA.